

Nano-engineered polymeric micelles for drug delivery to resistant tumor

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Abstract

Amphiphilic macromolecules self-assemble to nanoscopic core/shell structures in an aqueous environment, namely polymeric micelles that can encapsulate water insoluble drugs, proteins and DNA, and target therapeutics to their site of action in a passive or active way. Polymeric micelles share many structural and functional features with natural transport system, e.g., virus and lipoproteins. The versatility of the synthetic chemistry in polymeric micelles is a bonus providing opportunities to design appropriate nano-carriers for individual delivery requirements. Development of nano-engineered polymeric micellar formulations that can address the problem of drug resistance in cancer is the focus of our current studies. In this context, the effect of chemical manipulations on the encapsulation, release, bio-distribution and cellular interaction of the polymeric nano-carrier is assessed to select appropriate chemistries for optimized delivery of P-glycoprotein substrates to resistant tumors. Early results will be discussed in this presentation.